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AMMUNITION BULLETIN N° 24.

FOR INSPECTING ORDNANCE OFFICERS

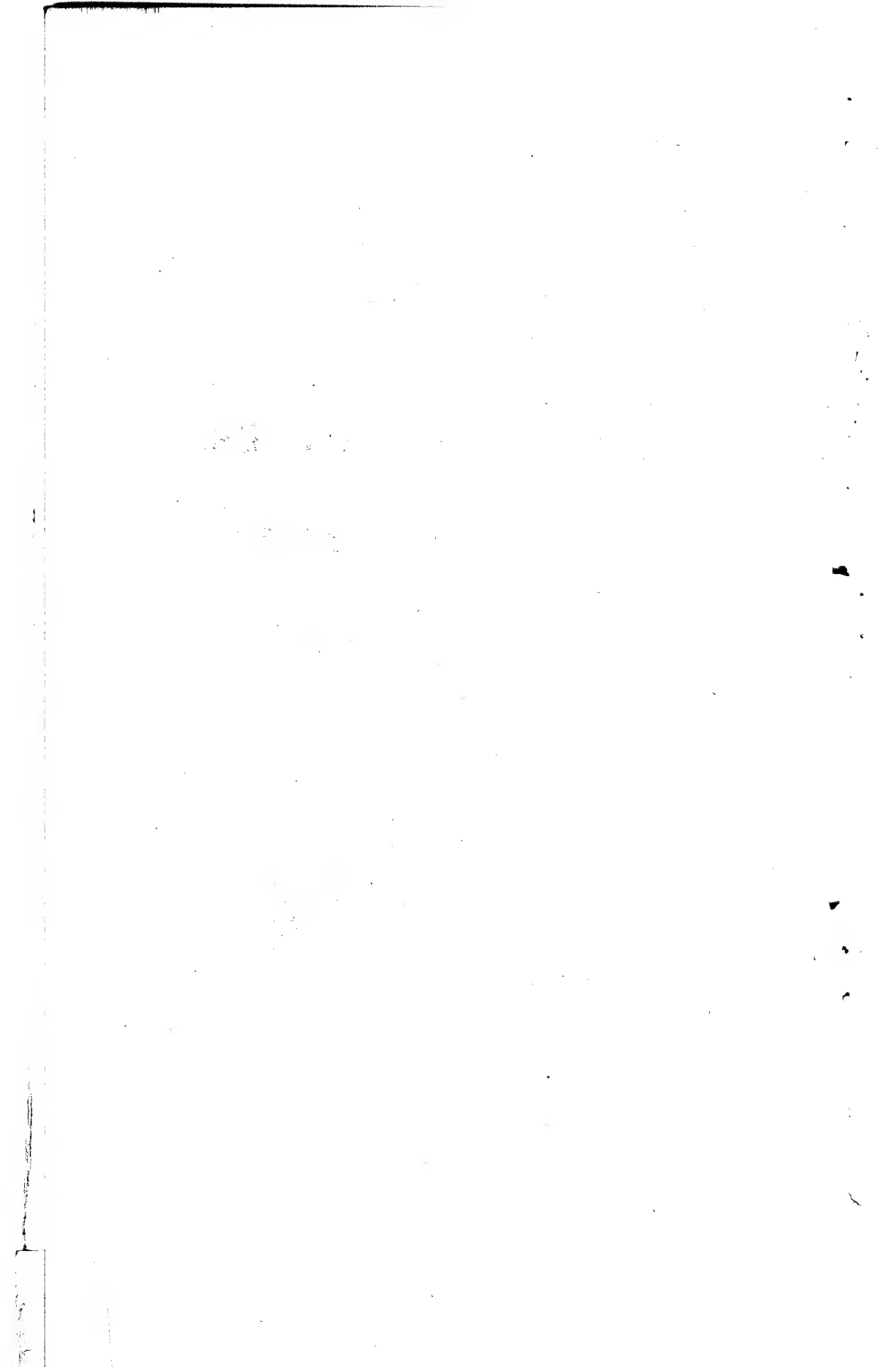
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(1941)

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CHIEF INSPECTOR OF ARMAMENTS,
WOOLWICH, S.E.18.



SECURITY.AMMUNITION BULLETIN NO. 24.ForINSPECTING ORDNANCE OFFICERSandA.A. AMMUNITION OFFICERS.

Issued by :-

CHIEF INSPECTOR OF ARMAMENTS,

WOOLWICH.

November, 1941.

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410. AMENDMENTS.

380. CARTRIDGES, B.L. 7.5-INCH FOR MARK VI NAVAL GUNS IN LAND SERVICE.

Cartridges to be handed over by the Navy will have concentrated igniters and will require to be fitted with auxiliary igniters type "A".

The following charges, to Land Service design, have been approved:-

Half Charge.

31-lb. 2½-oz. Cordite W.M.182 with 3-oz. tinfoil discs covered with worsted cloth at one end, and an "E" igniter at the other. This is a full size igniter. The charge is 22.65 inches long and has a diameter of 6.8 inches.

Quarter Charge.

15-lb. 9-oz. 4-dr. Cordite W.M.182 with 1½-oz. tinfoil discs covered with worsted cloth at one end, and a closing disc at the other. This charge is to be used with the half charge to provide a three-quarter charge and must be loaded first as it carries no igniter. The charge is 11.4 inches long and has a diameter of 6.8 inches.

381. ROCKET, "U", CHEMICAL, 5-INCH. PACKING

Reference Bulletin No.22, Item 324, page 4.

Rockets assembled for "Ready Use" in boxes M.118 which subsequently have to be transported will first be dismantled and re-packed as issued; i.e. 2 bombs in a grey box and 2 tails in a stone coloured box.

382. BOMBS, SPIGOT, MORTAR 29 MM. CARTRIDGE MARKINGS AND FAIRINGS.

Reference Items 336, 337, 339, Bulletin No.22. A cartridge with a simplified base will be used for the 20-lb. H.E. anti-tank bomb, the 14-lb. H.E. bomb and the 14-lb. practice bomb to accelerate production.

To facilitate identification the following markings will appear on the cartridges :-

- (a) The absence of ring markings indicates that the cartridge is for use with the 20-lb. H.E. anti-tank bomb.
- (b) A red ring on the front portion, half an inch from the junction with the rear portion, indicates the cartridge is for use with the 14-lb. H.E. bomb.
- (c) A black ring in a similar position indicates the cartridge is for use with the 14-lb. practice bomb.

The system of marking by rings of knurling has been eliminated.

The use of the fairing with the 20-lb. bomb is discontinued.

383. CARTRIDGES, Q.F. 3.7-INCH GUN, H.E. DUPLICATION OF BATCHES B.6101 AND B.6102.

As the result of duplication of the above batch markings the following variations in the propellant charges will be met :-

Batch B.6101.

Rounds in packages sealed with station labels bearing the letters RY contain Cordite W.M.

Rounds in packages sealed with station labels bearing the letters Kby contain N.H. powder.

Batch B,6102.

Rounds in packages sealed with station labels bearing the letters Ry or Kby contain N.H. powder but of different lots.

384. STATION MONOGRAMS.

The monogram given in Item 317, Bulletin No.21, for Shrawdine is cancelled.

385. CARTRIDGE, Q.F. 25-PR. COMPOSITE CHARGE OF CORDITE W.M.061 AND N.H. POWDER 025.

In order to accelerate production, approval has been given for a composite charge consisting of the following nominal charges:-

- Charge 1 - N.H.025, 8-oz. 4-dr.
- Charge 2 - Cordite W.M.061 + 8-oz.
- Charge 3 - Cordite W.M.061 + 13-oz. 8-dr.

In view of the possibility of some interchange of the more volatile ingredients of these two natures of propellant, in the same cartridge, which may slightly affect the stability of both and the ballistics of the N.H. charge, the cartridges are subject, provisionally, to a service "life" of 2 years at home and one year abroad.

Cases and packages containing these charges will bear the propellant code letter of both natures (O and E) and they will be stencilled to indicate the month and year of filling.

386. ROCKET, U. 3-INCH. MARKING OF PACKAGES CONTAINING TAILS PROPELLING.

Boxes M.96 and M.97 packed with 3-inch tails containing propellant charges of weights between 12-lb. 8-oz. and 12-lb. 9-oz. without spacing tabs and discs or end washers (See Item 266, Bulletin No.19) will be stencilled on the sides "III WT".

Boxes packed with 3-inch tails containing cordite restricted in use to temperatures not exceeding 80°F. will be stencilled (80°F.) on the sides and ends. (See Item 364, Bulletin No.23).

387. FUZE BASE PERCUSSION LARGE NO.479A. MK.I.
Fig.136.

This fuze which may be met with in B.L. 5.5-inch C.P.C. shell received from the Navy is very similar to the other detonating types with optional delay action which are described in Item 263, Bulletin No.19. The main differences, as shown in the Figure, are in the ignition chamber and the magazine.

The letter "A" following the fuze number distinguishes this fuze from the No.479 in which a C.E. pellet instead of one of picric powder is fitted in the cavity in the head of the needle holder. This cavity in the No.479 fuze is closed by a green paper disc.

388. GRENADE HAND, A.T. NO.75.
Fig.137.

Reference Item 373, Bulletin No.23, the igniter assembly is shown in Fig.137. The crushing of the glass capsule by the striker, when pressure is applied to the body or the striker plate, liberates the sulphuric acid which in contact with the mixture of potassium chlorate and charcoal produces a flame and so initiates the detonator.

The estimated filled weight given for this grenade in Item 373 is the approximate weight of the filling. The estimated weight of the filled grenade is 2-lb. 4-oz. and the consequent approximate weight of the box G.70, filled, is 40-lb. Amendments are included in this Bulletin.

Nobels Victor Powder used for the exploders is an explosive of the anti-frost ammon gelignite type consisting mainly of nitroglycerine, ammonium nitrate and T.N.T.

389. PRIMER PERCUSSION Q.F. CARTRIDGE NO.28 MK.I.
Fig.138.

This primer corresponds with the U.S.A. M.22A1 except that 3 grains of the 75 grain filling of G.12 powder are retained in position in the primer head cavity by a paper disc. (See Item 391).

390. GELIGNITE. INSPECTION AND TESTING.

Reference Bulletin No.22, Item 344, para.4. At firing proof of 8-oz. cartridges, the space between the adjacent ends of the two cartridges will be 1.5 inches.

391. CARTRIDGES, Q.F., 75 MM., H.E. M.48.
Fig.139.

These cartridges which apparently take their name from the fuze used, i.e. point detonating fuze M.48, exist as super charges, normal charges and reduced charges and are used in the Mark I (M.1897), the Converted Mark I (M.1917) and in the M.1916 guns.

The components of the rounds and approximate weight of propellant are as follows :-

Cartridge	Propellant	Primer	Shell	Booster	Fuze P.D.
Super Charge.	2-lb. FNH.	M.31	M.48	M.20	M.48
Normal	1.13-lb. FNH.	M.22A1	M.48	M.20	M.48
Reduced	.56-lb. FNH.	M.22A1	M.48	M.20	M.48

The M.18 cartridge case is the same type as that used with the other cartridges for these equipments.

The primer percussion M.22A1 differs from the M.31 in having a 75 grain filling of powder instead of 150 grains. For details and drawing see Item 250 and Fig.81, Bulletin No.19.

The shell M.48 is of forged steel and is fitted with a bakelite fuze-well cup. The head of the shell is struck with a radius of 22-inches and the rear portion is streamlined at an angle of 8 degrees, 45 minutes. The base is fitted with a base cover in accordance with the usual U.S.A. practice as a precaution against premature. The standard weight of the shell, filled and fuzeed is 14.6-lb. and the weight of the grade 1 T.N.T. bursting charge is 1.47-lb.

The booster M.20 is described in Item 392.

The fuze P.D. M.48 is described in Item 393.

Dimensions.

The overall length of the fuzeed round is approximately 26.6-inches and the weights, according to charge are :- Super charge 19.56-lb. Normal Charge 18.7-lb., Reduced Charge 18.14-lb.

Marking.

The markings on the "Normal" charge cartridge are shown in the Fig.

The super charge has the word "SUPER" stencilled on the body and base of the case but the system of marking by black bands and rings is not used.

The reduced charge has the word "REDUCED" stencilled on the base of the case and between two black rings on the body. The base is also marked by two black bands across the diameter at right angles to each other.

Packing.

Individual fuze rounds are packed in "Container, fibre, 75 mm. M.38A" which is a cylindrical package of the paper type with metal recessed end pieces, the lid end being sealed by adhesive tape. (See Item 250, Bulletin No.19). The adhesive sealing tape is coloured yellow to indicate the H.E. shell and bears stencilling indicating the patterns of gun for which the round is suitable, the designation of the projectile and of the charge. The ends of the container are marked to indicate : the patterns of gun, the designation of the projectile, the lot number with fillers initials, the designation of the fuze and the container.

The stowage dimensions of the container are, diameter 4-inches, length 27.3-inches, empty weight 3-lb. and filled weight - according to charge:- Super 22.6-lb., Normal 21.7-lb., Reduced 21.2-lb.

Three containers are carried in a clamping device which is designated, "Bundle, Packing for 75 mm. Gun, M.1897, M.1916 and M.1917 Ammunition." Details of this device are given in Item 250, Bulletin No.19. (The cubic displacement given in this Item was amended to read .73 cubic feet in Item 323, Bulletin No.21).

392. BOOSTER, M.20.
Fig.140.

This is a U.S.A. gauge with the magazine filled C.E. and fitted with a rotor, or shutter, which carries the detonator. The booster carries no needle, its detonator being initiated by the detonator of the fuze beneath which it is used.

The brass body is screwthreaded externally near the top for insertion in the fuze hole of the shell and near the bottom for the attachment of the aluminium booster cup. The top of the body is recessed and screwthreaded to receive the fuze. A smaller circular recess, with its centre displaced from the centre of the body, is formed below the fuze recess. The smaller, or rotor, recess is closed by a brass cover with a central perforation which is closed by a disc of onion skin paper. The recess is provided with a stop pin to limit the movement of the rotor, a recess to accommodate rotor locking pin when the rotor is in the armed position and a channel through which the brass centrifugal pin protrudes to engage the rotor in the safe position.

The channel housing the centrifugal pin communicates with another channel in the body containing a brass locking pin, or detent, which is supported on a spring and keeps the centrifugal pin engaged with the rotor until set back occurs.

A channel leading from the rotor recess to the booster cup is closed by means of a closing cup which consists of a gilding metal envelope containing 3.25 grains of C.E.

The brass rotor which is .4 inches in depth is pivotted on a steel pin fitted in the recess and carries a detonator consisting of an aluminium cup containing 3.86 grains of lead azide over a 1.26 grains pellet of C.E. The aluminium cup is closed at the top by a disc of aluminium foil and at the bottom by an aluminium disc which is coloured red.

The detonator is positioned on a washer of compressed cork and secured by ringing around 340 degrees of its circumference. A radial recess in the side of the rotor accommodates the brass rotor locking pin and connects with a second axial recess drilled from the underside of the rotor which contains the rotor locking pin lock, a short cylindrical piece of brass with radiussed ends.

Action.

On acceleration the locking pin of the centrifugal pin sets back, overcoming its spring and is retained in this position by its stem engaging with screw cap containing the centrifugal pin. During flight the centrifugal pin is moved out of engagement with the rotor and the rotor revolved by centrifugal force. The turning of the rotor on its pivot is limited by the stop pin and brings its locking pin in line with the locking recess in the body. The rotor locking pin, moved outward by centrifugal force, protrudes into the locking recess and is retained in this position by the lock which is moved forward by creep action to occupy the space vacated by the locking pin. The rotor is then held with its detonator aligned between the flash hole in the underside of the fuze and the C.E. filled closing cup leading to the magazine. When the fuze functions the flash is communicated to the detonator in the booster which, through the closing cup, bring about the detonation of the C.E. in the magazine.

The centrifugal pin is designed so that it will not arm at 1500 R.P.M. but must arm at 2000 R.P.M.

Markings.

The rotor cover plate is stamped with the designation of the booster, the initials or symbol of the contractor, the year of manufacture and the lot number.

Weights and Dimensions.

The filled weight of the booster is .73-lb. the length is 2.04 inches and the diameters, 1.71 inches at the base and approximately 2 inches at the screwthreaded portion near the head.

Packing.

The booster is normally issued assembled in the shell. When issued apart, each booster is contained in a newsboard carton provided with a tearing cord for opening purposes and a sealing tape. The dimensions of the carton are 2.3 x 2.3 x 2.1 inches.

The following information is given on the label:- designation of booster, initials or symbol of filler, lot number, month and year of packing, drawing number and revision date of drawing.

80 boosters, each in a carton are packed in a wooden box with strawboard or pasted chipboard packing pieces and a length of tape passed around one carton in each layer.

The weight of the box empty is 10.75-lb. and 73-lb. when filled. The stowage dimensions are 21.4 x 13 x 6 inches, i.e. .96 cubic feet.

Details of the contents and lot are stencilled on the lid - which is secured by screws, two of which are sealed - at both ends and sides. The month and year of packing are stencilled on one side, also the gross weight and cubic dimension.

393. FUZE, POINT, DETONATING, M.48.
Fig.141.

This U.S.A. fuze is used in conjunction with booster M.20 and is a D.A. and graze type with a delay element associated with the graze mechanism. The D.A. action can be eliminated by setting the fuze to "delay" before loading. The optional delay device produces a delay of approximately 0.05 seconds.

The striker and detonator assemblies contained in the brass head of the fuze are similar to those in fuze M.46 described in Item 359, Bulletin No.23. The head is connected to the steel body of the fuze by a steel tube and an ogive of aluminium is fitted. The ogive has a hole near its lower edge which gives access to the setting sleeve and is engraved with two setting lines, one marked "Delay", the other "S.Q." (super quick, i.e. direct action).

The body is screwthreaded for insertion into the booster and is provided with a central flash channel which is intersected by an inclined channel containing the brass interrupter. This channel is enlarged at its outer end and accommodates the setting arrangement. A recess in the underside of the body contains the graze mechanism with delay element and is closed by a brass closing screw which is in the form of a ring carrying a diaphragm of gilding metal.

The setting arrangement consists of a spring cup, a spiral spring, a setting sleeve, a tension split spring and a retainer. The spring cup is in the form of a brass disc on the periphery of which two parallel flats are formed. The outer face of the disc is recessed to receive one end of the spiral spring. The setting sleeve consists of a brass cylinder the walls of which are cut away leaving two portions, diametrically opposite, which correspond with the flats on spring cup. The outer end of the sleeve is solid, with a recess on its inner face to receive the spiral spring, and is reduced in diameter to pass through the retainer. The outer face is provided with a slot for the purpose of setting. The tension spring which is interposed between the setting sleeve and the retainer consists of a length of music wire, in the form of a split ring, with the ends inclined in opposite directions.

The graze mechanism consists of a plunger body, or inertia pellet, which carries the detonator and delay assemblies and is held off the delay firing pin by means of a restraining, or creep, spring. A safety arrangement to keep the firing pin and detonator apart is also included. This consists of a plunger support and two spring loaded centrifugal pins.

The brass plunger body is cylindrical with a central channel which receives the plunger support and is reduced in diameter near the base to form a flash channel. Two inclined channels are also formed to house the centrifugal pins. The upper side is recessed and the rim thus formed is cut away in two places to receive projections formed on the plunger head and so prevents the head, with the firing pin, turning relative to the body. A channel, displaced from the centre of the body, contains the initiating and delay assemblies and terminates in an inclined flash channel at the base. The assemblies consist of a relay detonator containing 1.47 grains of lead azide, a delay holder containing .4 grains of pressed gunpowder covered by a brass baffle, a gilding metal washer and above this a primer. The primer is a brass cup containing .31 grains of primer mixture. Two holes in its base, and the top of the primer are closed by gilding metal discs. The top of the channel containing these assemblies is closed by a brass plug with a central aperture for the firing pin.

A cylindrical housing of gilding metal is fitted round the plunger body and secured by a locking pin which passes radially through both. The upper edge of the housing is turned inwards and retains the striker head.

The striker head consists of a flanged disc of aluminium alloy with two diametrical projections which in conjunction with the recesses in the rim of the plunger body prevent independent rotation. The head is recessed to receive the plunger support, bored centrally to provide a fire channel and is fitted with a steel firing pin.

The plunger support is made of corrosion-resisting steel.

Action.

(a) Setting sleeve set to "S.Q."

With the setting sleeve in this position its two part-cylinder portions coincide with the flats on the spring cup. In flight, the spring cup, the interrupter and the centrifugal pins are moved outwards by centrifugal force thus unmasking the flash channel and clearing the channel below the plunger support. The arming requirements of these devices specifies that they must not arm at 1500 rpm but must arm at 2000 rpm. The striker assembly is protected from air pressure by the metal closing disc in the head of the fuze. On impact the gilding metal support of the striker is crushed and the striker pierces the detonator. The flash produced passes through the flash channel and the base closing disc and initiates the detonator in the booster.

The graze mechanism also functions on impact but is preceded by the S.Q. action. In the event of the S.Q. action failing, the fuze will produce a graze action with delay.

(b) Setting sleeve set to "Delay"

With the setting sleeve in this position its two part-cylinder portions are not aligned with the flats of the spring cup and prevent the cup moving outward. The interrupter is thus retained in the masking position and eliminates the effect of the S.Q. action. On graze the plunger body overcomes the restraining spring and, moving forward over the support, impinges the primer on the delay firing pin. The flash produced by the primer mixture passes through the spiral channels formed in the periphery of the baffle and ignites the pressed powder in the delay holder. This fires the relay detonator which in turn initiates the detonator in the booster via the inclined flash channel.

Packing.

The fuzes are normally issued assembled in Q.F. 75 mm. M.48 H.E. rounds. When issued apart each fuze is packed in "Container, fibre M.47, for fuzes". This is a waterproofed rolled paper cylinder with a diameter of 2.9 inches and 5.3 inches in length. The estimated filled weight is 1.71-lb.

50 containers are packed in a wooden box which is fitted with a hinged lid secured by sealed hasps and turnbuckles. The approximate dimensions of the box are ~~15.9~~ ^{17.4} x 15.9 x 13, i.e. 2 cubic feet.

The estimated weight of the empty box is 18.5-lb. and the filled weight, 105-lb.

Marking.

The markings on the package include the designation, quantity and lot number of the fuzes. The date of packing, gross weight and cubic dimension are also shown.

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394. CARTRIDGE Q.F. 90 MM. H.E. M.58 FOR GUN M.1.

The components of this fixed Q.F. round for the 90 mm. A.A. gun are :-

Primer	Case	Propellant	Shell	Booster	Fuze
M.28A1.	M.19	6.82-lb. N.H.	H.E., M.58.	M.20	M.43A1

Primer percussion M.28A1 is similar to the M.31, described in Item 250 and Fig.81 in Bulletin No.19 but contains 300 grains of powder in the body which is 9.75 inches long.

Case M.19 is of brass, 23.7 inches in length and the taper is increased ~~near~~ the mouth which is attached to the shell by 4 indents and sealed with N.R.C. compound.

Shell, H.E., M.58, which is streamlined, contains a 2.67-lb. bursting charge of T.N.T. and is fitted with a bakelite fuze-well cup similar to that in Fig. 139.

Booster M.20 is described in Item 392.

Fuze M.43A1 is described in Item 395.

Weights and dimensions of ammunition.

Overall length of round - 37.44-inches.
 Weight of complete round - 39.15-lb.
 Weight of shell, filled and fuzed - 21.0-lb.

Packing.

The rounds are packed fuzed.

Each round is packed in a sealed, waterproofed, rolled paper, cylindrical container with metal end pieces. The sealing tape is coloured yellow to indicate H.E. and bears the designation of the gun and projectile. The end plates bear the designation of gun, shell and fuze, also the ammunition lot number followed by the fillers initials. The container is known as "Container, fibre, 90 mm., M.53".

4 rounds in containers are packed in a wooden box which is fitted with a tie rod. The rod passes from end to end through the centre of the box. A head is formed at one end and a winged nut is fitted at the other. The winged nut is secured by a seal.

The number of rounds, designation of shell and the ammunition lot number are stencilled on the ends of the package. The same details and, in addition, the month and year of packing, shell weight zone, gross weight and cubic dimensions of the package are stencilled on the sides.

Weights and dimensions of Packages.

Container - 38.2 x 5.7 inches, empty 7.5-lb., packed 46.7-lb.
 Box - 43.7 x 13.3 x 13.3 inches, 4.43 cubic feet,
 empty 37-lb, packed 224.4-lb.

395. FUZE, TIME, MECHANICAL, M.43A1.
 Fig.142.

This is an igniferous type with a mechanism operated by centrifugal force and controlled by an escapement. The time of running is 30 seconds and the design prevents arming unless set beyond 1.67.

Apart from the mechanism the fuze consists of three main parts;- the body, the lower cap and the upper cap.

The body which is made of aluminium alloy is screwthreaded for the attachment of the M.20 booster. The graduations are numbered from 2 to 30 and sub-divided into divisions of .2. The safe position is indicated by a graduation marked "S". To the right of this there is a setting line which is used in conjunction with a similar line on the lower cap for adjustment when the fuze is being assembled. The magazine formed in the underside of the body contains a circular bag made with two silk discs and filled with 20 grains of "Army Black Powder Grade A.4". The magazine is closed by a screwed plug which has a central hole. The hole is lightly closed by a brass washer and paper disc at its coned inner end. A large circular recess is formed in the upper side of the body to accommodate the mechanism. The base of the recess is drilled to receive a locating pin, three assembly screws and the detonator holder. The cylindrical wall of the recess has a circumferential groove in its outer face which, in conjunction with a similar groove in the lower cap, accommodates the tensioning spring.

The lower cap which is made of brass has an internal circumferential groove near its base, where it fits over the body, for the tensioning spring. Four equally spaced curved recesses are formed in this groove. In each of these recesses an adjusting screw, inserted from the exterior of the lower cap, protrudes. The tensioning spring is a length of music wire in the form of a ring with the two extreme ends turned outwards. These ends are accommodated in a hole in the wall of the lower cap. The hole is sealed from the exterior with shellac. Four equally spaced curved bends are formed in the wire ring to correspond with the similar recesses in the groove of the lower cap. With the wire ring housed in the corresponding grooves of the body and cap, the four adjusting screws, bearing on the curved bends, are manipulated until the torque necessary to turn the lower cap is between 40 and 60 inch pounds. This adjustment is made and the screws secured by staking at assembly. The head of the cap has a large central threaded hole to receive the upper cap, two smaller ones for the screws securing the hammer spring to its inner face and, opposite to these, a hole in which is secured the setting pin.

The upper cap, in the form of a frustum, is made of aluminium. Near the base it is threaded for assembly in the lower cap where it is secured by indentations.

The mechanism is shown diagrammatically in the Fig.143.

Action.

When set to "safe" the leaf formed on the periphery of the safety disc masks the firing slot in the timing disc and thus prevents rotation of the firing arm. The dimensions of the leaf are designed to mask the slot until the fuze is at a setting beyond 1.67.

In turning the lower cap to set the fuze, the turning movement is transmitted to the time disc by the setting pin engaging the lug on the timing disc. The safety disc is held stationary by its retaining lug engaging the recess in the flange of the bush. Thus the firing slot in the timing disc is moved clear of the leaf on the safety disc and to a distance from the upturned end of the firing arm which is governed by the length of the setting.

At assembly, the collar on the bush is adjusted against the spring washer so that the torque necessary to turn the timing disc is between 1.26 and 1.57 inch pounds.

On acceleration the hammer spring sets back and bends the lug on the timing disc clear of the setting pin. At the same time the set back pin slides back through its spring and ceases to act as a stop to the pin protruding from the shaft of the firing arm.

During flight the following movements are caused by centrifugal force:-

- (a) The safety lever of the escapement is rotated against its retaining spring and releases the escapement lever.
- (b) The weighting studs on the centrifugal segments cause the segments to rotate and impart a turning movement to the centre spur and pinion which carries with it the disc assembly at its head. The turning movement is controlled by the escapement through the train of gears.
- (c) The weighted end of the firing arm tends to swing outwards but this movement is prevented by the upturned end of the arm coming in contact with the periphery of the timing disc.

When the timing disc has rotated sufficiently to bring the slot in its periphery in alignment with the upturned end of the firing arm the arm rotates and brings the recessed side of its shaft towards the safety plate. The safety plate now free to rotate is turned by centrifugal force and releases the firing pin. The firing pin is driven onto the detonator and the flash produced passes to the silk bag of powder in the magazine.

Weights and dimensions of fuze.

4-55 The fuze has a maximum diameter of 2.4 inches. The overall length is 5-74 inches and the length between the flange and base is .81 inches.

The estimated weight is 1.41-lb.

Packing.

The Q.F. 90 mm. H.E. round is packed with the fuze inserted. When issued separately each fuze is packed in container M.47 and 50 containers are packed in a wooden box. Details of the container and box are given in Item 393. Amend
37
490

396. Q.F. 40 mm. AMMUNITION MANUFACTURED IN U.S.A. MARKINGS. (See also item 473 Bulletin No 27)

The following details regarding the marking and painting of Q.F. 40 mm. ammunition being made in U.S.A. are published for information:-

Projectiles.

Those filled T.N.T. and fuzed will be painted dark green.

Inert projectiles will be painted red.

The presence of the tracer igniter will be indicated by a white paint marking of which details are not yet available.

The manufacturers initials, month and year of manufacture and 40 mm. Mk.I Mod..... are stamped on the driving band.

Tracer Igniter.

Mark VIII, Mod....., lot number, initials of filling station and date of filling are stamped on the base.

Fuze.

Mk.XXVII, Mod...., contractors initials, lot number, initials of filling station and date of filling are stamped on the fuze.

Cartridge Case.

The base of the case will be stamped with the initials or symbol of the manufacture, the year of manufacture and 40 mm. Mk.I.

Primer.

The initials or symbol of the manufacturer, Mk.XXI, initials or symbol of filling station, year of filling and lot number will be stamped on the base.

397. PROPELLANT CODE LETTERS. LETTER FOR M.4.X AND LIST.

The code letter **M** will be used to indicate M4X propellant.

The letters now in use are as follows :-

- A. Cordites N or N.Q.
- B. Ballistite.
- C. Cordite R.D.B. in cord or tube.
- D. Cordites M.D., M.C. or M.D.C. in cord or tube.
- E. Cordites W. or W.M.
- F. Cordites M.D. or R.D.B. in flake.
- H. Cordite H.S.C.
- J. Cordite Bofors.
- L. F.N.H. powder or F.N.H./P powder.
- M. M.4.X.
- N. N.C.T. of 1914 to 1918 manufacture.
- O. N.H. powder.
- S. Cordite S.C.

398. CARTRIDGES. Q.F.. 2-PR. MARKS IX AND X GUNS. HIGH VELOCITY CHARGE AND MARKINGS.

Approval has been given for a high velocity charge of 9-oz. 12-dr. cordite W.M.T.148-048 for these guns and the following identification markings.

- (a) Cartridge. A band, $1\frac{1}{2}$ inch wide, immediately above the flange of the case and the letters "HV" above the band in two diametrically opposed positions. This marking is made by the silver nitrate process and the letters are $\frac{3}{4}$ -inch stencilling.
- (b) Container. The letters "HV" stencilled in yellow on a blue rectangular background. This marking appears on opposite faces of the container.
- (c) Box. The raised panels on the sides and the recess in the ends are painted blue and the letters "HV" stencilled in yellow on these backgrounds.

399. CARTRIDGES M.L. 3-INCH MORTAR. PROPELLANTS.

Reference Item 366, Bulletin No.23. The following propellants have been approved for augmenting cartridges :-

- (a) 65 grains charge of 81 mm. Hercules mortar powder, .005 or .010 inch, graphited. These augmenting cartridges will be used in conjunction with the 91 grains 81 mm. powder primary cartridge.
- (b) 88 grains charge of Cordite W.016 or W.M.017. These augmenting cartridges will be used in conjunction with the 95 grains ballistite cartridge.

400. PROPELLANTS. N.C.(Y). COLOURING.

As the result of the introduction of a new dye in the manufacturing process of this propellant the colour of the grains will be orange or pink.

401. GRENADE, HAND, ANTI-TANK, NO.73, MK.I.

This grenade, described in Item 265, Bulletin No.19, will be declared obsolete.

402. CARTRIDGES, S.A.A. BASE MARKINGS.

The following base markings have been approved for S.A.A. manufactured in British factories :-

R.L. Woolwich.
R.G. Roadway Green.
S.R. Spennymoor and Aycliffe.
S.T. Steeton and Thorp Arch.
B.E. Blackpool and Swynnerton.

403. CARTRIDGES, S.A. .303-INCH RIFLE GRENADE. ALTERNATIVE PROPELLANT.

The use of Hercules 81 mm. mortar powder, .010 inch thick, as an alternative to Ballistite for .303 Rifle Grenade Cartridge has been approved.

404. CARTRIDGES, 2-INCH, BOMB THROWER. USE OF HERCULES 81 MM. MORTAR POWDER.

An 18 grains charge of Hercules 81 mm. mortar powder, graphited, .005 inch thick has been approved as a substitute for ballistite B.16.

405. CARTRIDGES Q.F. ADAPTER MK.VII AND METAL IGNITER MK.II.

The Mark VII adapter and Mark II metal igniter, recently introduced, are designed to be used together. Unlike the earlier marks, the screwthreaded portions by which they are attached when assembled in the case do not taper.

406. PLUGS, FUZE-HOLE, CONTAINER-HOLE AND BASE, SHELL.

The following designs of moulded plugs in fully cured phenol-formaldehyde material have been approved.

Plug, fuze-hole, transit, 1.05-in., Mk.IVE.
" " " 1.2-in., Mk.IVE
Plug, container-hole, transit, 1.65-in., Mk.IIE.
Plug, fuze-hole, 1.77-in., No.1, Mk.IIE.
Plug, base, shell, No.4, Mk.IIE Class D.
" " " No.5, Mk.IIE Class D.
" " " No.7, Mk.IIE.
" " " No.8, Mk.IIE
" " " No.15, Mk.IIE Class D.
" " " No.19, Mk.IIE Class D.

ENEMY AMMUNITION.407. GERMAN FUZE, DOPP Z. S/90. SAFETY.

The following is a translation of an extract from German Artillery instructions:-

"15 cm. K. Gr.18 and 21 cm. Gr.18 shell with Dopp Z. S/90 fuzes from which the safety pins have been removed are no longer safe to be moved as the safety pin cannot be fully re-inserted. These shell must therefore be fired either for time or for percussion. Rammed or blind shell without safety pins must not be loaded again. They are no longer safe to move and should be destroyed in accordance with H. Dv.305. It is forbidden to remove the safety pin from a Dopp Z. S/90 fuze for training or instructional purposes."

408. GERMAN H.E. 5 C.M. MORTAR BOMB.

This is a 1 kg. H.E., streamlined mortar bomb of the anti-personnel type with a vaned tail unit which carries the cartridge. The bomb is fitted with a quick acting nose fuze which carries a gaine.

Body.

The body is of mild steel with walls 4 mm. thick and has a cylindrical portion near the head. This cylindrical portion has a diameter of 5 cm. (1.96-in.) and has three annular grooves formed in it. A screwthreaded fuze hole is formed at the head and the base end is similarly prepared to receive the cartridge container portion of the tail unit. The body contains a bursting charge of T.N.T. which has an approximate weight of 127 grammes (4.5-oz.) and is designed to provide a cavity for the inner end of the fuze with its gaine.

Tail Unit.

The tail unit consists of a cylindrical cartridge container to which eight vanes, formed in pairs, are spot welded. The container is of mild steel and is closed at the front end where a screwthreaded spigot is formed for attachment to the body. Six perforations are provided near the front end of the container for the escape of pressure and a fixing screw is fitted near the base for the purpose of securing the cartridge.

Markings.

The whole of the bomb is painted a dull red and stencilled in black.

Dimensions.

The overall length of the round is 21.6 cm. (8.5-in.)

Fuze Wgr: Z. 38.

The body and main parts of the fuze are of aluminium with the exception of the detonator pellet which is of steel and the retaining spring and cover disc which are of brass. The mechanism consists of a striker secured to a cup-shaped moveable pellet in the head of the fuze and located in a guide in the form of a tube which leads to the detonator. This guide is attached to the moveable detonator pellet with a weak spring interposed between its forward end and the striker pellet which is the means of keeping the striker and detonator apart when the fuze is armed. For safety in transport and storage, 9 steel balls are located between the striker pellet and the detonator pellet by means of an arming sleeve supported by an arming spring. This device prevents the detonator being prematurely fired by contact with the striker as the result of shocks and

bars which might otherwise overcome the weak spring of the striker. The arming sleeve has a flange formed around the rear end to engage with the tongues of the retaining spring - fitted in the detonator pellet - when the fuze is armed.

Action.

On acceleration the arming sleeve sets back compressing its spring and engaging with the tongues of the retaining spring which prevent it rising again. The striker is prevented from setting back and piercing the detonator by the steel balls. During flight the steel balls move forward into the striker pellet the available space in which has been increased by the setting back of the arming sleeve. The striker and detonator are then held apart only by the striker spring. The striker pellet is protected from air pressure by the brass closing disc in the head of the fuze. On graze or impact the striker spring is compressed and the striker fires the detonator. The flash from the detonator passes to the initiator filling in the head of the gauge which brings about the detonation of the gauge filling and thus detonates the bursting charge of the bomb.

10. AMENDMENTS.

Bulletin No. 23, Item 373 :-

Line 26. Delete "1-lb. 8-oz." and substitute "2-lb. 4-oz." ✓

Page 15, lines 2 and 3 Delete "G. 20" and substitute "G. 70" ✓

Line 6. Delete "30-lb." and substitute "40-lb." ✓

Bulletin No. 21, Item 317 :-

Delete line 13.

Bulletin No. 23, Item 361 :-

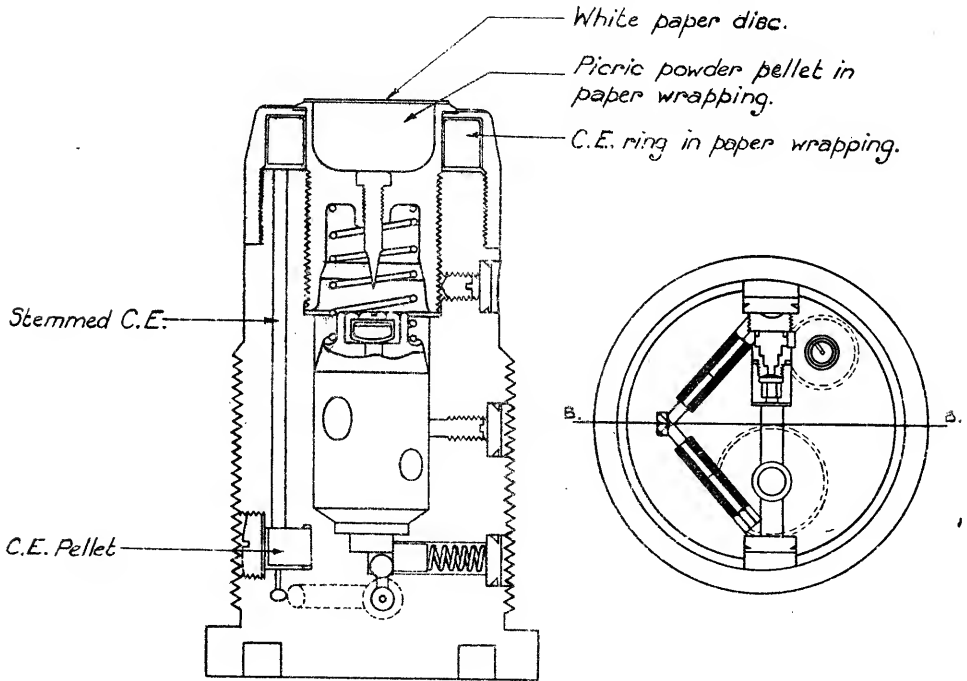
Para. 8, line 3. After "conveyance", delete full stop and add "by passenger train." ✓

Item 365 :-

Last line. Delete "T.N.T." and substitute "C.E." ✓

FIG. 136.

FUZE, PERCUSSION, BASE, LARGE. N° 479.A. MK.I.



SECTION. B.B.

FIG. 137.

GRENADE A.T. HAND N° 75. COMPLETE IGNITER ASSEMBLY (Scale $\frac{2}{1}$)

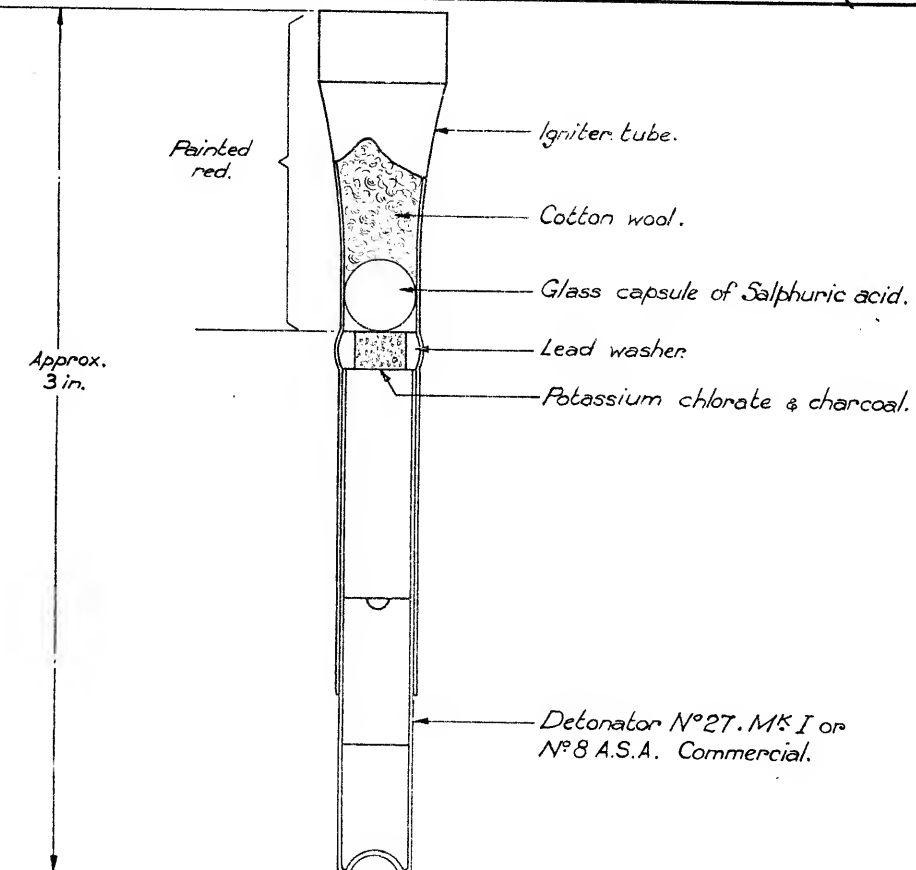
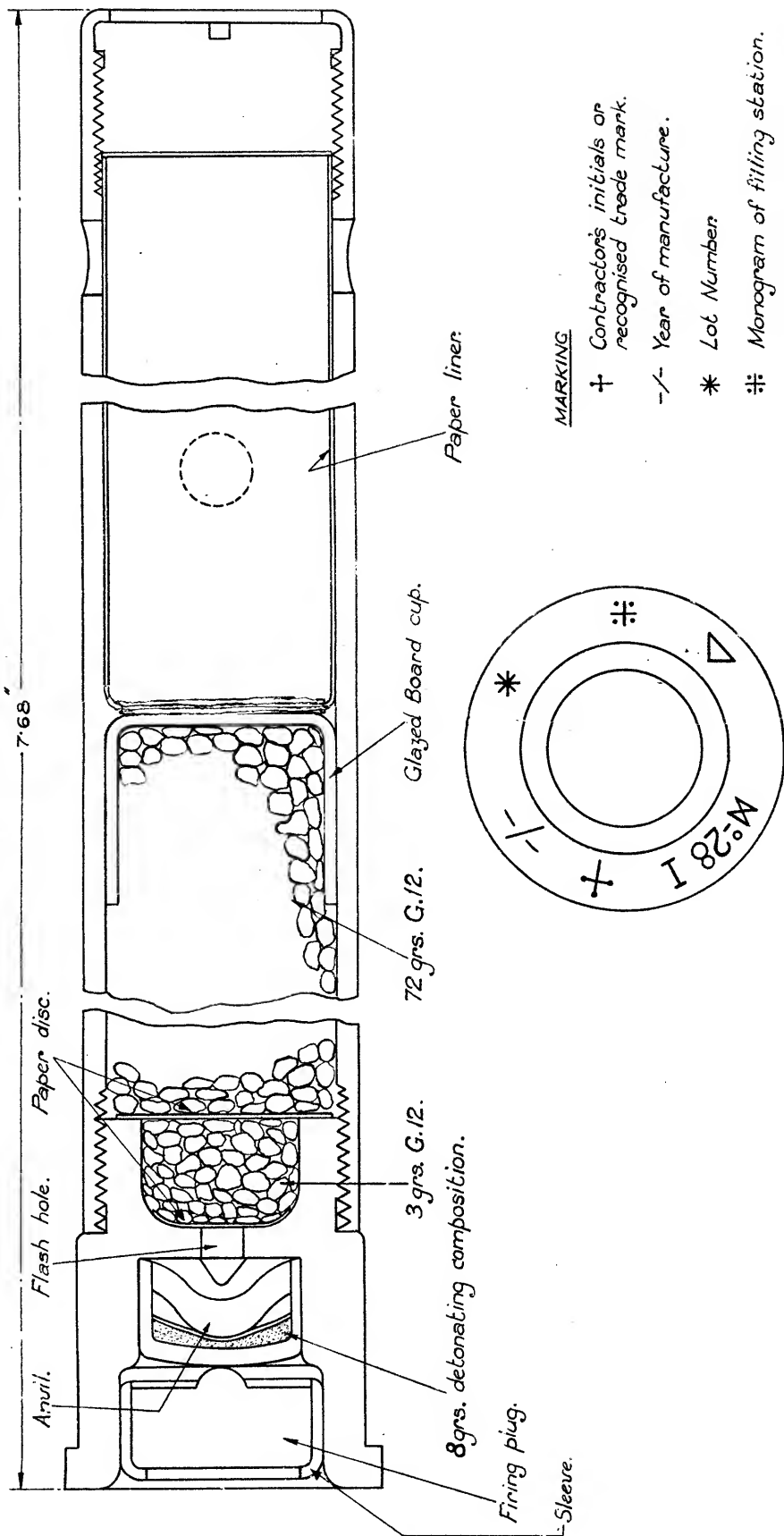


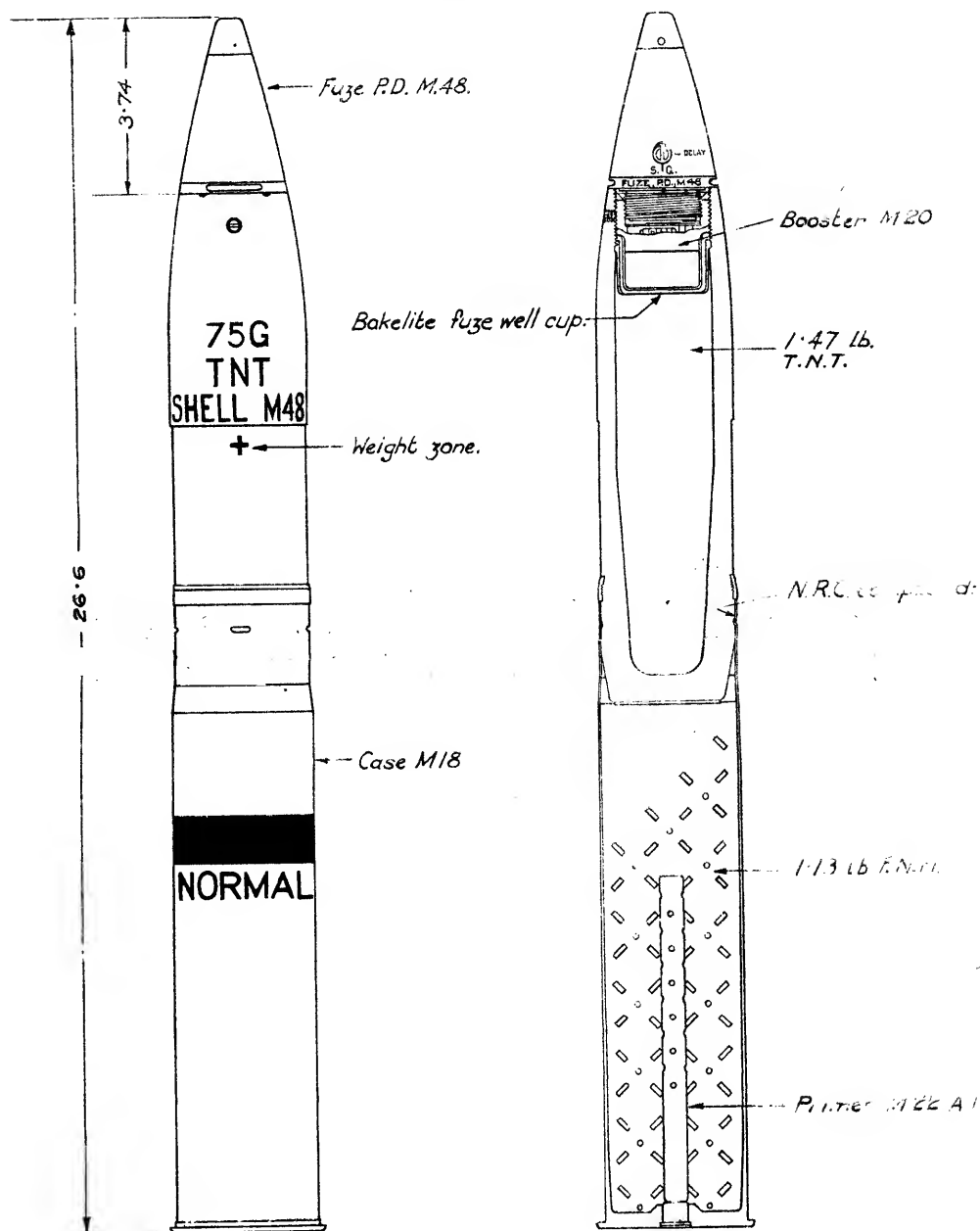
FIG. 138.
PRIMER PERCUSSION Q.F. CARTRIDGE. N° 28 MARK I.



Scale 1/1

FIG. 139.
CARTRIDGE, Q.F., 75 M.M. H.E. M.48.

Scale 1/3



Lot N° of complete round & fillers initials



FIG. 140.
BOOSTER M.20.
 Scale $\frac{2}{1}$

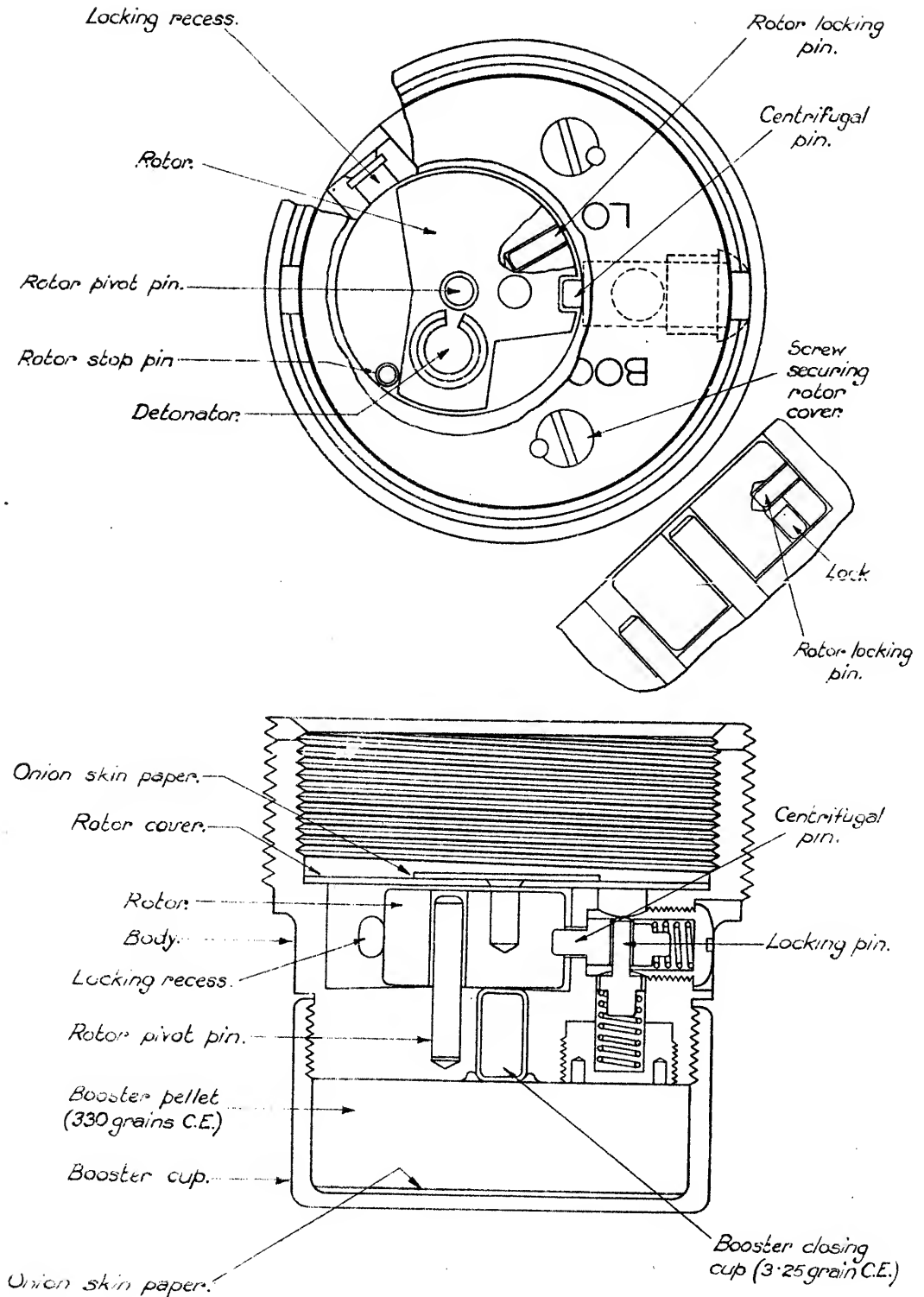


FIG. 141.
FUZE, POINT, DETONATING M.48.
Scale. 2/1

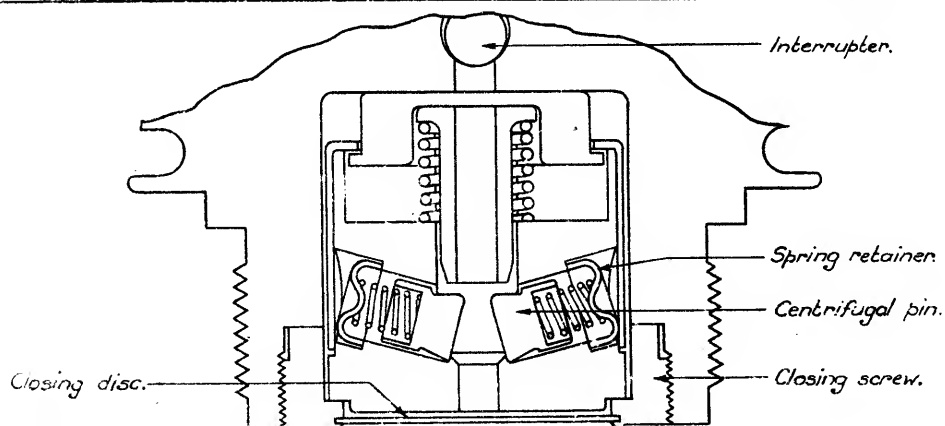
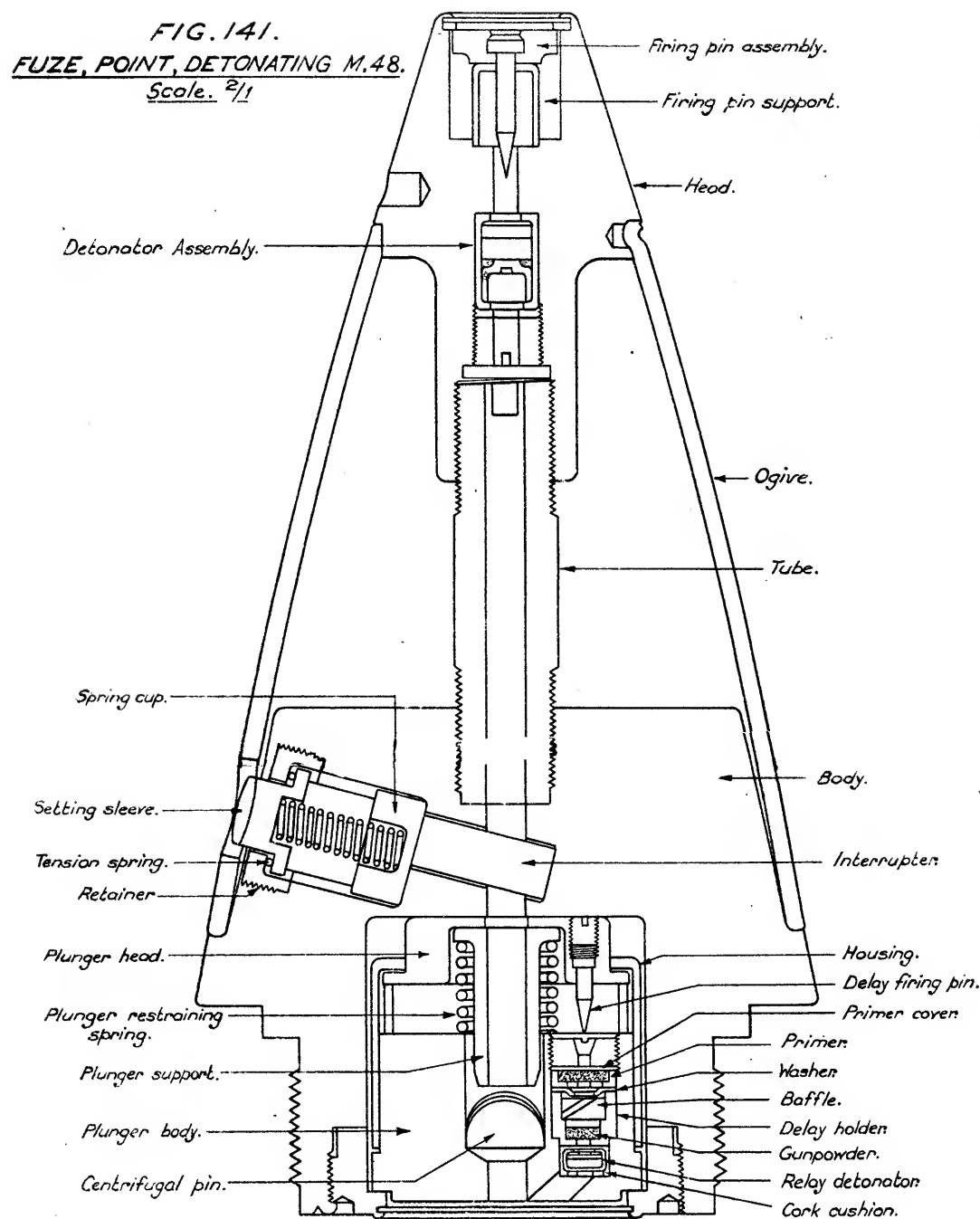


FIG. 142.

FUZE, TIME, MECHANICAL, M.43. A.1.

Scale. 2/1

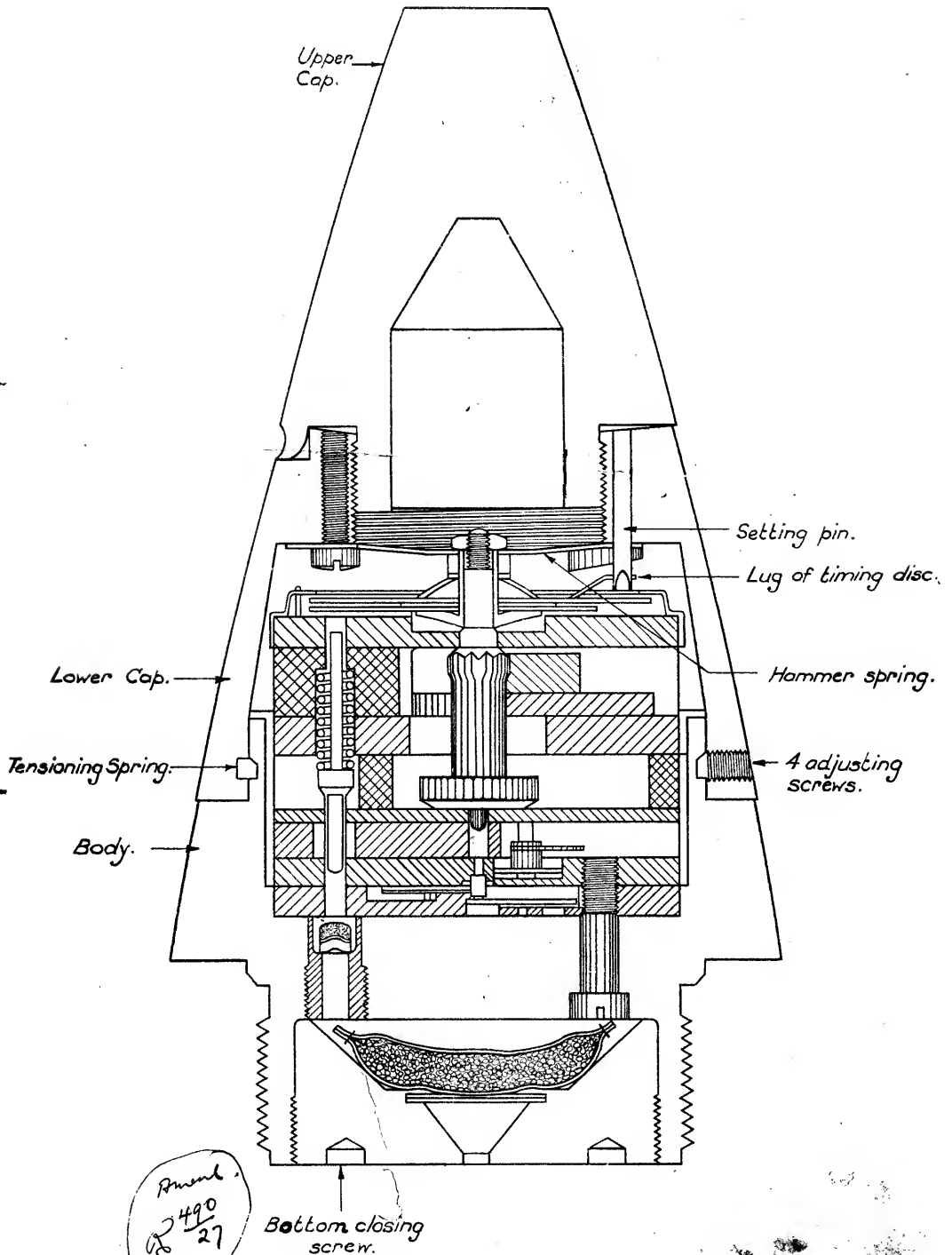


FIG. 143.

FUZE, TIME, MECHANICAL . M. 43. A. 1.
DIAGRAM.

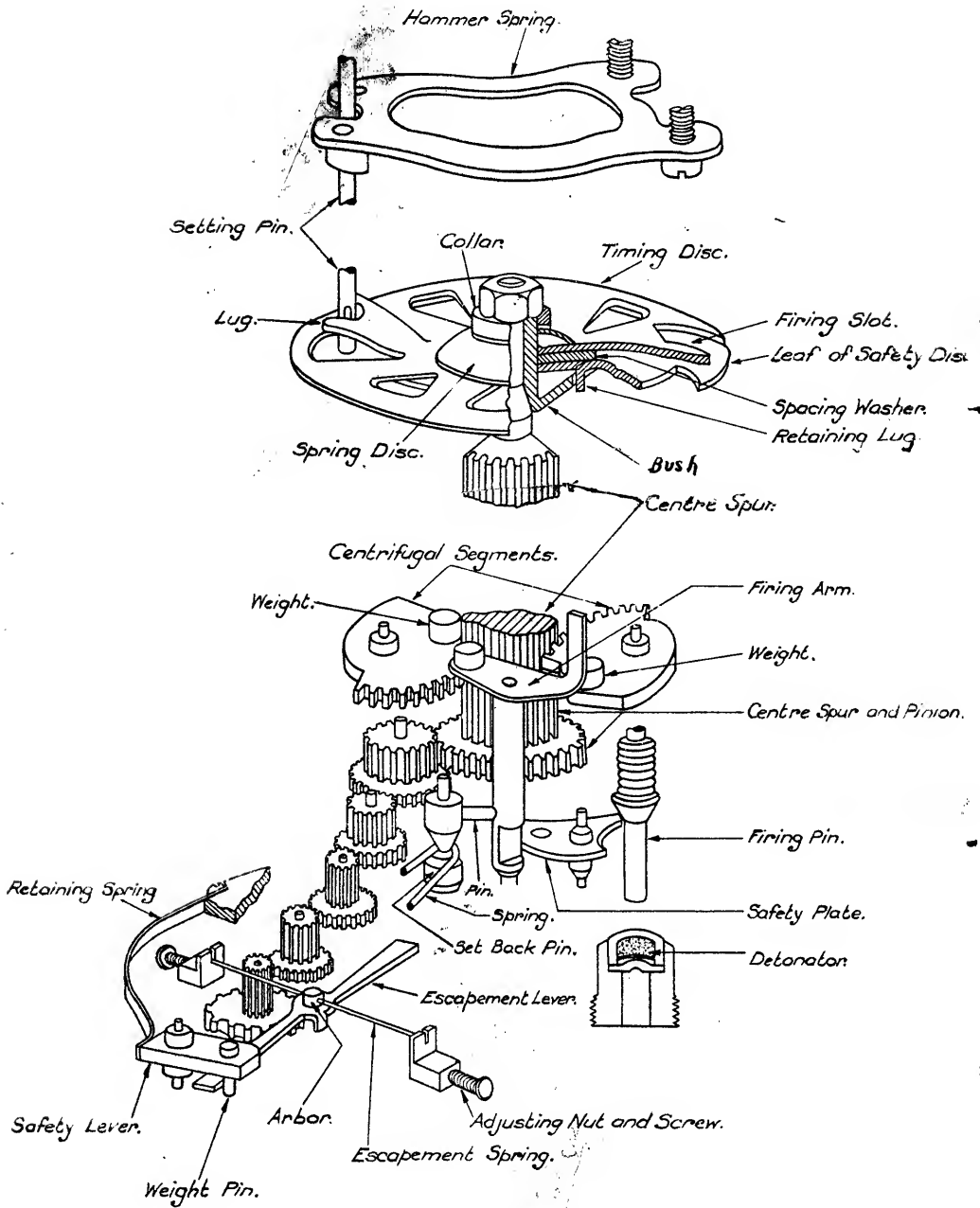


FIG. 144.

GERMAN H.E. 5-CM. MORTAR BOMB.

